HOYA CORPORATION
Uniphot Corporation
Woodside, N.Y. 11377 Nashville, Tenn. 37203
Glendale, Calif. 91201 Seattle, Wash. 98117

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HOYA CORPORATION

HOYA

Your Guarantee of Excellence

$1.00

Filters and Lens Accessories

Hoya aims to contribute to the world of tomorrow — its social environment and its culture — by using the most advanced technology to explore the rich promise inherent in glass and to shape it into forms that will bring pleasure and benefit to millions.

HOYA TODAY

Hoya corporation consists of three independent divisions, Crystal, Ophthalmic and Optical and each division is top-ranked in its field.

Crystal Division produces everything from daily use tableware to the highest class crystal glassware and sparkling chandeliers, as well as products which embody true artistic expression in elegant simplicity. The skill and true beauty incorporated in the products have resulted in a visit by our Emperor and Empress to appreciate the highly creative process. And Hoya products glitter on the shelves of Tiffany's of New York.

In the **Ophthalmic Division,** the products can be divided into lenses, frames and ophthalmic instruments. Of special note are Hoya's soft contact lenses which provide eyesight correction without undue discomfort for the user. Another major line is the sophisticated ophthalmic instruments. These instruments are for use by ophthalmologists and laboratories for assuring perfect correction of deficiencies.

Optical Division is the progenitor of all of Hoya's operations. Hoya's outstanding strength as the world's largest manufacturer of photographic filters is reflected in the fact that HOYA ND filter was installed in the Apollo Moon rocket, and that some of our colored glasses for industrial use were built in the most worldwide famous cameras. Now concentrating of our efforts on the marketing of Interchangeable Lens, other major products are optical glasses for cameras, binoculars, telescopes etc., and are enjoying highly regarded reputation. Hoya's technology, with its acclaimed platinum-tank and continuous production method and its equipment were exported to Poland in 1973.

Hoya has also entered the field of Opto-Electronics featured in laser glass, delay-line glass, photomask substrate, which is expected to become the fourth division in the foreseeable future.

Hoya Corporation: looking for better ways to bring out the rich inherent beauty and functions of glass, and to shape it into ways that contribute to your needs both now and in the world of tomorrow.

MOUNT TYPE	Slip-on Type							Bayonet Type				Series Type					
SIZE (mm)	28.5	30	32	34	36	37	42	B30	B36	B40	B50	S4	S5	S6	S7	S8	S9
Skylight 1B	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
UV (0)	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
80A	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
80B	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
80C	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
81A	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
81B	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
81C	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
82A	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
82B	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
82C	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
85	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
85B	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
85C	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
PL								●			●		●	●	●	●	●
ND (×2, ×4, ×8)			O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
K2 (Yellow)	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
G (Orange)	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
25A (Red)	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
XO (Yellow Green)	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
X1 (Green)	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Diffuser			O	O	O	O	O	O	O	O	O		O	O	O	O	
Cross Screen			O	O	O	O	O	O	O	O	O		O	O	O	O	
Close-Up			O	O	O	O	O	O	O	O	O	O	O	O	O	O	
Zoom Close-Up															O		

HOYA FILTERS ARE AVAILABLE WITH THE FOLLOWING FOUR TYPES OF MOUNTS.

(1) **Screw-in** Used by almost all recent cameras, this type of filter has threads that match the female threads cut into camera lenses.

(2) **Slip-on** Seldom used for recent cameras, this type slips on over the camera lens.

(3) **Bayonet** Used on some TLR cameras, this type is easily attached and detached. The B50 has a double bayonet so another filter or lens hood can be attached.

(4) **Series** Attached by means of an adapter ring. The same filter can be used with several cameras by providing an adapter ring for each different lens.

FILTER FACTORS

Since photographic filters absorb light, exposure must be increased to compensate for the effective light absorbed. The number by which the exposure must be increased, for a particular filter used with a particular film, is called the filter factor.

While these factors for basic applications are given below, as well as on the filter instruction sheet, the factor will vary according to the shooting conditions. The precise filter factor is determined by considering the film type and specific light source. Therefore, filter factors indicated are for your reference only. The filter factor and exposure compensation required is as follows:

	Filter factor	f-stop		Filter factor	f-stop		Filter factor	f-stop		Filter factor	f-stop
1B	1	0	80A	2.4	$1\frac{1}{3}$	82A	1.3	$\frac{1}{3}$	FL-DAY	2	1
UV (0)	1	0	80B	2	1	82B	1.4	$\frac{1}{2}$	FL-W	2	1
K2 (Y)	2	1	80C	1.9	1	82C	1.5	$\frac{2}{3}$	ND×2	2	1
G (0)	2.5	$1\frac{1}{3}$	85	2	1	81A	1.4	$\frac{1}{2}$	ND×4	4	2
25A (R)	8	3	85B	2.1	1	81B	1.4	$\frac{1}{2}$	ND×8	8	3
X0 (YG)	2.5	$1\frac{1}{2}$	85C	1.8	1	81C	1.5	$\frac{2}{3}$	PL	3~4	$1\frac{2}{3}$~2
X1 (G)	4	2							PL-Cir	3~4	$1\frac{2}{3}$~2

SIZE AND MOUNT TYPE

● HMC filter
● Rotating Type

Screw-Type / SIZE (mm)	22.5	24.5	25.5	27.5	29.5	30.5	34.5	35.5	36.5	37.5	39	40.5	43.5	46	48	49	52	55	58	62	67	72	77	82	86	95	105
Skylight 1B	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●	●	●	●	●	○	○	○
UV (0)	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●	●	●	●	●	○	○	○
80A	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●	●	●	●	●	○	○	○
80B	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●	●	●	●	●	○	○	○
80C	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●	●	●	●	●	○	○	○
81A	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●	●	●	●	●	○	○	○
81B	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●	●	●	●	●	○	○	○
81C	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●	●	●	●	●	○	○	○
82A	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●	●	●	●	●	○	○	○
82B	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●	●	●	●	●	○	○	○
82C	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●	●	●	●	●	○	○	○
85	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●	●	●	●	●	○	○	○
85B	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●	●	●	●	●	○	○	○
85C	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●	●	●	●	●	○	○	○
FL-Day	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
FL-W	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
PL		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
PL-Cir														●	●	●	●	●	●	●	●	●	●	●			
ND (×2, ×4, ×8)	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●	●	●	●	●	○	○	○
UV (0)	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●	●	●	●	●	○	○	○
K2 (Yellow)	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●	●	●	●	●	○	○	○
G (Orange)	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●	●	●	●	●	○	○	○
25A (Red)	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●	●	●	●	●	○	○	○
X0 (Yellow Green)	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●	●	●	●	●	○	○	○
X1 (Green)	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●	●	●	●	●	○	○	○
Center-Spot														○	○	○	○	○	○	○	○	○					
Soft-Spot														○	○	○	○	○	○	○	○	○	○	○			
Color-Spot														○	○	○	○	○	○	○	○	○	○	○			
Split-Field														●	●	●	●	●	●	●	●	●					
Fog Filter														○	○	○	○	○	○	○	○	○	○	○			
Diffuser	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Duto														○	○	○	○	○	○	○	○	○	○	○			
Cross Screen	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Star-Six														○	○	○	○	○	○	○	○	○	○	○			
Star-Eight														○	○	○	○	○	○	○	○	○	○	○			
Variocross														●	●	●	●	●	●	●	●	●	●	●			
Multivision													●	●	●	●	●	●	●	●	●	●					
Vari-Multivision															●	●	●	●									
Color-Multivision													●	●	●	●	●	●	●	●	●	●	●	●			
Half-Color																●	●	●	●	●	●	●	●	●			
Dual-Color														●	●	●	●	●	●	●	●	●	●	●			
Tricolor														●	●	●	●	●	●	●	●	●					
PL-Color														●	●	●	●	●	●	●	●	●					
Vario PL-Color														●	●	●	●	●	●	●	●	●					
Pol-Fader														●	●	●	●	●	●	●	●	●					
Pop Filter														○	○	○	○	○	○	○	○	○					
Andromeda														●	●	●	●	●	●	●	●	●	●	●			
Pulsator														●	●	●	●	●	●	●	●	●	●	●			
Nebula														○	○	○	○	○	○	○	○	○	○	○			
Rainbow-Spot														●	●	●	●	●	●	●	●	●	●	●			
Close-Up	○	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	●	○	○	○				
Zoom Close-Up															○	○	○	○	○	○							
Infrared														○	○	○	○	○	○	○	○	○	○	○			
U360																○	○	○	○	○	○	○	○	○			
Y44																○	○	○	○	○	○	○	○	○			

WHY ARE FILTERS NECESSARY?

Filters for Color Films

The human eye has an amazing ability to adapt to different light sources. For example, if we look at a piece of white paper outdoors and then bring it indoors under artificial light, it appears reddish at first and then slowly regains its original white. And, even when wearing colored sunglasses, white paper appears white to us.

This ability, however, is completely absent in photographic films because they are made to respond only to certain types of light. Thus, pictures taken with color film sometimes appear too red or blue, depending on the color temperature of the light source. Correction then becomes necessary. This is the main reason that filters are necessary in color photography.

Filters for Black and White Films

Filters are also required in black and white photography. But for a slightly different reason than for color photography.

Beginners often take photographs which include a beautiful blue sky and white clouds, only to be disappointed because the entire sky area appears white in the finished prints. In other cases, colors of clothing and other objects are rendered with an unnatural balance between the tones in black and white photographs. All of these are due to the fact that black and white film does not respond to the various colors in the same way as does the human eye.

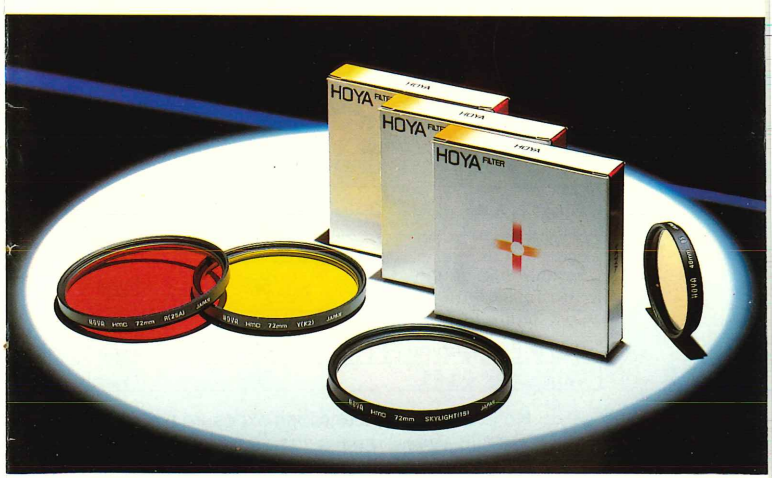
The role of filters for black and white film is to correct picture contrast. Selecting the proper filter can render white clouds vividly bright against a dark sky. Or make the tones of colored objects appear balanced and natural.

Filters for Special Effects

These filters produce special effects that allow a wide range of emotional expression in photographs.

Special effect techniques can be used with both movie and still cameras by merely attaching them to the front of the lens like ordinary filters. Special effect filters can also be combined with other types of filters for an endless variety of new effects.

By understanding the nature of filters for color and for black and white films, and special effect filters, you will be able to greatly advance the development of your photographic technique.



TYPES OF COLOR FILMS

Color films can be classified in the following ways:

1. Reversal type and negative type.
2. Daylight type and tungsten type (Type A and Type B).
3. Type S (short exposure) and Type L (long exposure).

Reversal Type and Negative Type

With reversal type films, correct color balance must be obtained by using a filter when the exposure is made. This is because correcting the color balance of reversal films during development is very difficult. Thus, the correct color balance must be obtained when taking the picture.

Representative color films from around the world are listed in the following table. The characteristics of the various films differ so select filters by referring to the instructions provided with each type and manufacturer.

Daylight Type <5,500°K~6,000°K>

FILM NAME	ASA Speed	Remarks
Agfachrome 50S	50	
Agfacolor CNS 2	80	
Fujichrome R100	100	
Fujicolor Reversal Professional Type D	50	Type S
Fujicolor F-II	100	
Fujicolor F-II 400	400	
Kodak Ektachrome ER	64	Type S
Kodak Ektachrome ED	200	Type S
Kodachrome 64	64	Type S
Kodachrome 25	25	Type S
Kodacolor II	100	
Kodacolor II 400	400	
Sakuracolor II	100	
Sakuracolor II 400	400	
Vericolor-II Type S	100	Type S

Tungsten Type (Type A) <3,400°K>

FILM NAME	ASA Speed	Remarks
Fujichrome RT 200	200	
Kodachrome II Professional Type A	40	
Sakurachrome 40A	40	

Tungsten Type (Type B) <3,200°K>

FILM NAME	ASA Speed	Remarks
Agfachrome 50L	50	Type L
Fujicolor Reversal Professional Type T	50	Type L
Kodak Ektachrome EPY	50	Type L
Kodak Ektachrome EPT	160	Type L
Vericolor-II Type L	50	Type L

Note 1: Type L means long exposure type films and Type S means short exposure type films.
Note 2: Reversal films are shown in black letters and negative films in blue letters.

THE PRODUCTION PROCESS OF HOYA FILTERS

Each Hoya filter is the result of research, know-how and complete precision facilities backed by full quality control.

Before production starts, controls are first programmed into a computer. Then the finest materials are carefully mixed by an automatic V-blender for absolute uniformity. After being melted with highly sophisticated equipment, this material is then precision molded with automatic direct pressing equipment. The pressed blanks are next slowly and continuously cooled to remove strain, and are then polished by high-speed, double-surface polishing machines that assure precise surface quality.

Next is the coating process which improves the filter light transmission ability. And the transmission characteristics are checked by Spectro-Photometer, after which an ultrasonic cleaner removes all foreign matter from the surfaces. Only after passing all of Hoya's quality tests are the filters assembled, finished and made ready for shipment to customers throughout the world.

Lens Accessories

● LENS HOOD (metal & rubber)

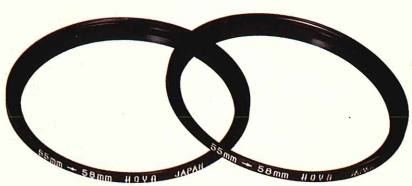
Available in two types: metal and rubber. Prevents extraneous light falling on the lens. Also protects the lens from dirt and dust.

● ADAPTER RING

Used with series type filters, ADAPTER RING allows the same filter to be used on several lenses.

● STEP-UP/DOWN RING

Enables the use of different size filters with one particular lens.

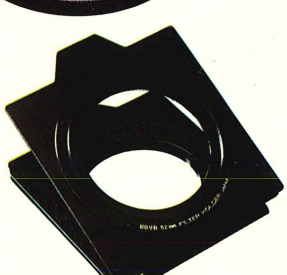


● METAL FILTER STACK CAP

Convenient filter storage with immediate access. Protects filters from dirt and dust.

● FILTER HOLDER

Holds thin material in front of the lens for special effects. For example, gelatin filters, glass plates, vinyl.



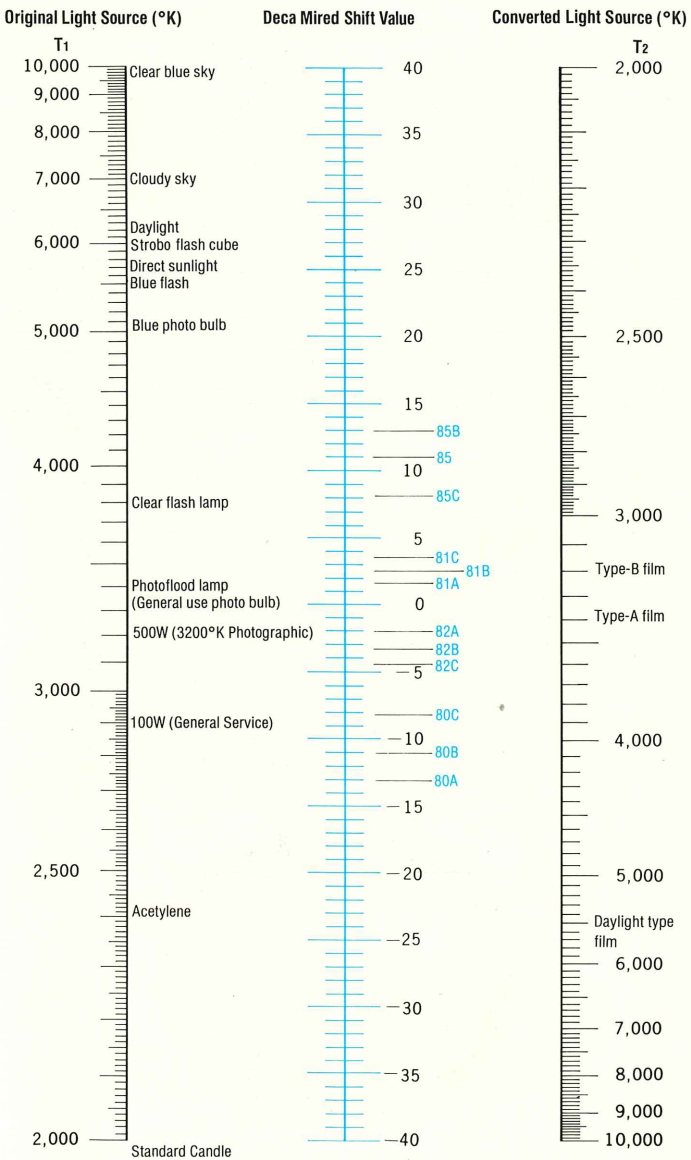
How to Select Color Conversion and Light Balancing Filters

Each color film is made to reproduce colors correctly when used with a specific light source. When other light sources are used, color conversion filters must be used to match the color of the light source to the film capabilities.

Light balancing filters are used for slight adjustments of the color of the light source for cooler (bluer) or warmer (redder) tones.

The following table is given for your convenience in selecting the proper filter. To determine the necessary filter, make a line from the original light source (T1) to the converted light source (T2). The proper filter will be indicated at the point where this line crosses the center column.

Light Source Conversion Diagram



HMC Filters

MULTI-COATED LENSES NEED MULTI-COATED FILTERS

With HMC Skylight 1B

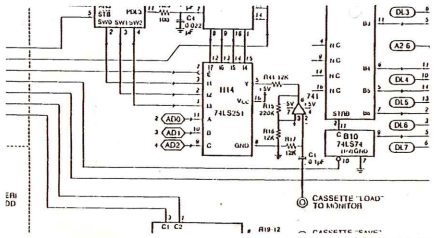
With non-coated filter

NON-COATED MONO-COATED

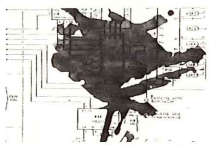
HMC MULTI-COATED

● INFRARED (R72, RM90)

Used for photography with infrared films. Infrared film is also sensitive to ultraviolet rays and the shorter wavelengths of the visible spectrum so it is necessary to filter out all but the infrared rays.
R72 passes only infrared rays above 720nm;
RM90 passes only that above 900nm. Often used in crime detection, medical photography, detection of distribution of vegetation, etc.
In ordinary photography with infrared film or infrared color film, the Y(K2), O(G), R(25A) and other filters can also be used to change the contrast or color effect.

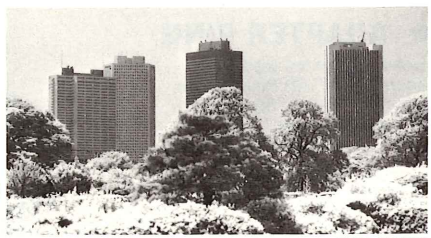


With R72



Without filter

Without filter



With RM90

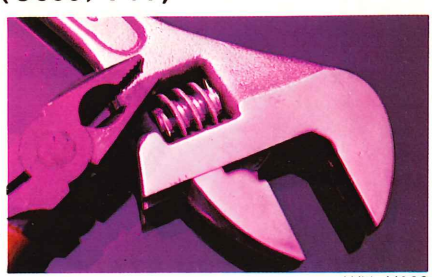
R72

RM90

● ULTRAVIOLET (U360, Y44)

For applications in ultraviolet photography, the U360 cuts off the light rays in the visible spectrum and passes ultraviolet rays. Used in crime detection, spectro-photography in the ultraviolet range, etc.

Y44 absorbs ultraviolet rays and blue rays in the visible spectrum and is used to photograph the fluorescence caused in objects by irradiation with ultraviolet rays. Used in crime detection, medical photography, etc.



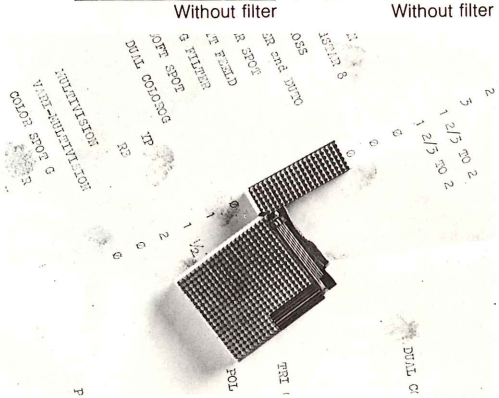
With U360

Without filter

Without filter

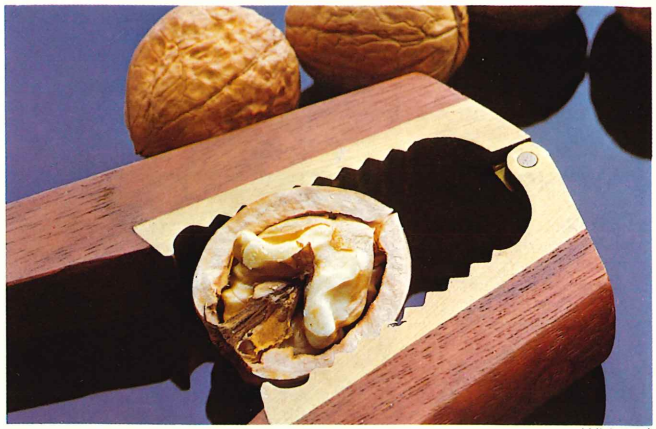
U360

Y44



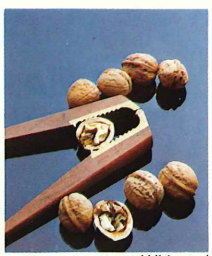
With Y44

● CLOSE-UP

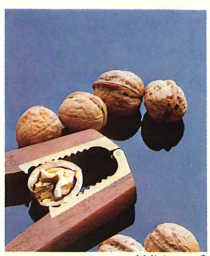


With + 4

Available in + 1, + 2, + 3 and + 4 diopters for close-up photography. Depth-of-field is shallow so use as small an aperture as possible, CLOSE-UPs offer a world of new creativity.



With + 1



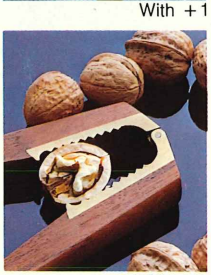
With + 2

+ 1

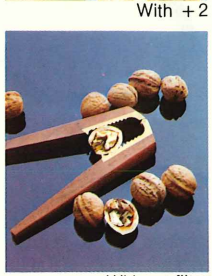
+ 2

+ 3

+ 4



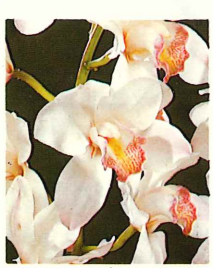
With + 3



Without filter

● ZOOM CLOSE-UP

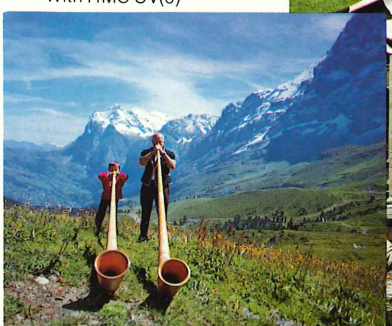
Attached to the camera lens, ZOOM CLOSE-UP can be rotated to vary the magnification ratio from about + 2 to + 10 diopters. Provides better control of composition or allows selection of desired details.



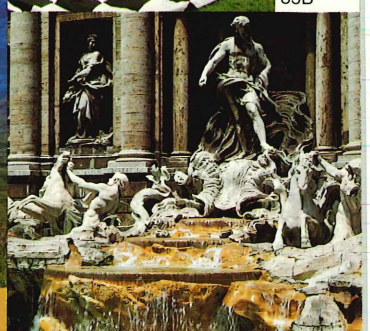
Hoya HMC (Multi-coated) are renowned for the ability to minimize light reflections on the filter surfaces, to reduce ghost and flare, etc.
The result is sharp contrast and well balanced color.
A must for obtaining the performance built into multi-coated lenses.
Pictures are sharper even against backlighting.
The types of Hoya multi-coated filters are shown on page 34.

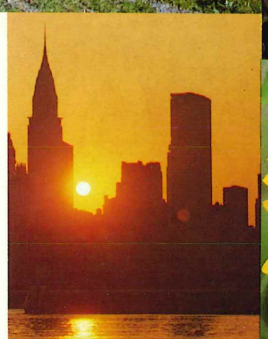
With HMC Skylight 1B

With HMC UV(0)



With HMC 85B

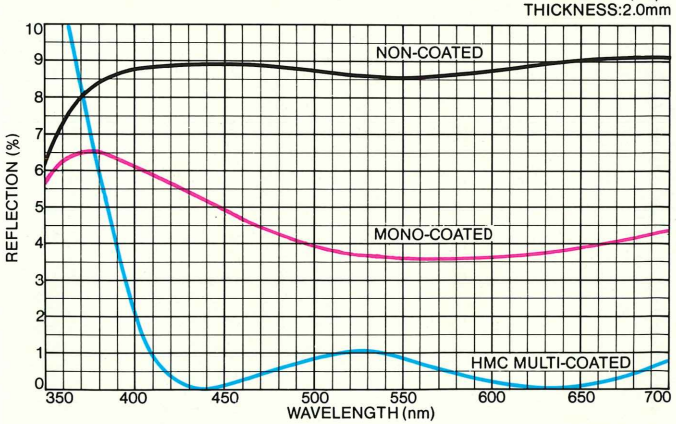


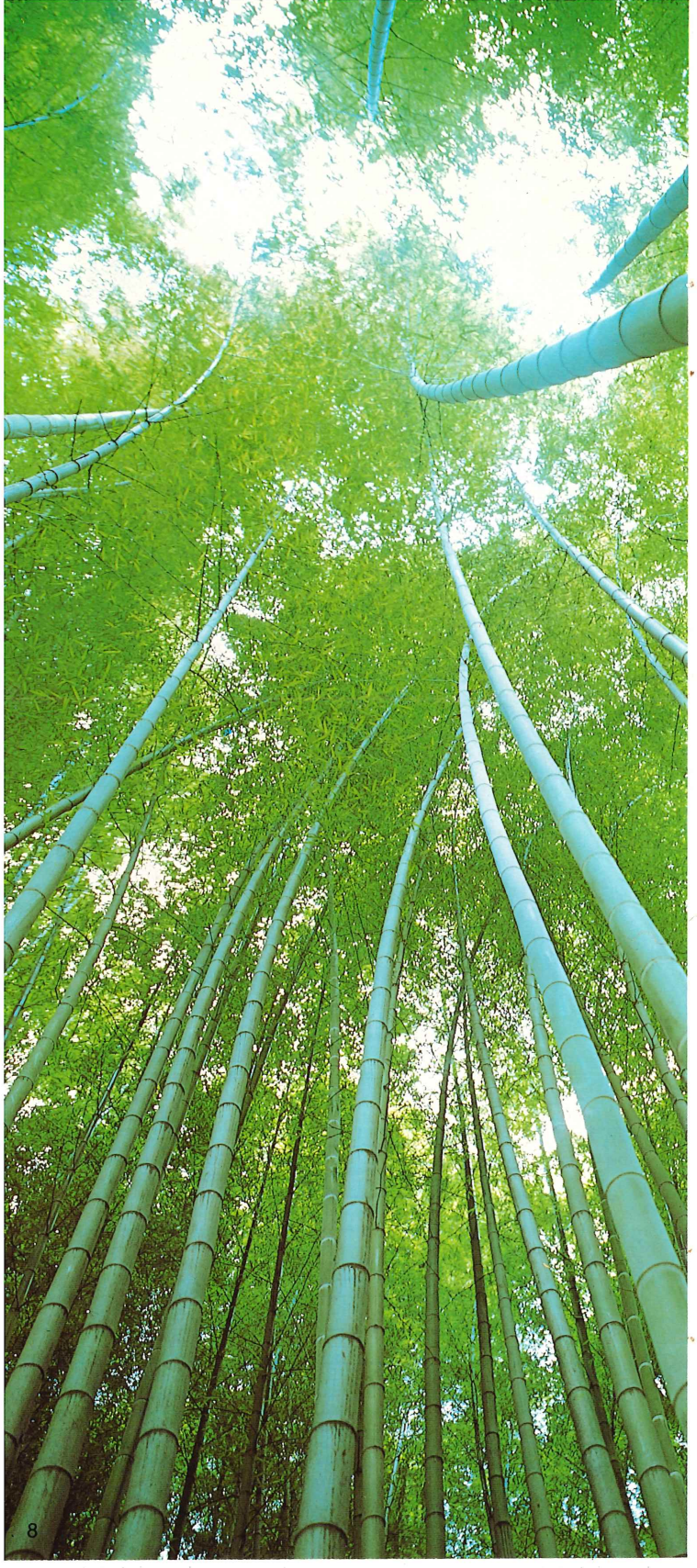


With HMC 82A

With HMC Close-Up

SKYLIGHT (1B)
THICKNESS:2.0mm



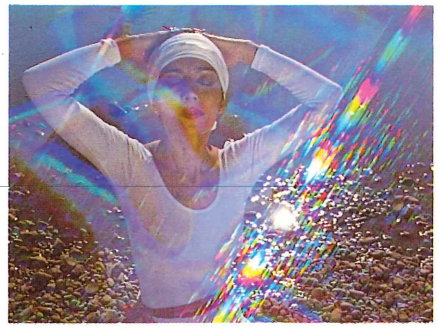


SPECTRAL STAR

Available in three types: ANDROMEDA, PULSATOR and NEBULA.
Made by etching special grid patterns into the surface of the filter.
Most effective when there are bright spots in the picture.
ANDROMEDA and PULSATOR are provided with rotating frames.
Use care to protect the plastic surfaces from damage.

● ANDROMEDA

Bright points of light are converted into linear, ghost-like images.
Striking color contrasts and strange effects are possible in endless profusion.



● PULSATOR

Each point of light becomes a burst of color of equal energy. An endless variety of effects is possible.

● NEBULA

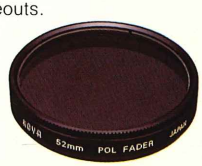
A fantastic whirling motion opens a new world of fascinating photography.

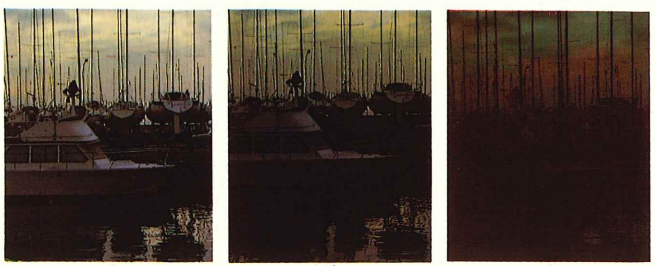
● RAINBOW-SPOT

Made of glass, and provided with rotating frames.
1,270 ultra-fine parallel grooves per inch pick up and diffract each tiny point of light into a rainbow of color.

● POL-FADER

A combination of two gray polarizing filters set in independently rotating frames. Rotating the frames varies the amount of light passed. Useful with exceptionally strong light sources, such as in solar photography, scientific applications, etc. Useful with movie cameras for fadeouts.





● POP FILTER

Available in a set of three color filters: blue, green and red. Used individually or in combination, extremely original color effects can be obtained. Also great for multi-exposure creativity.

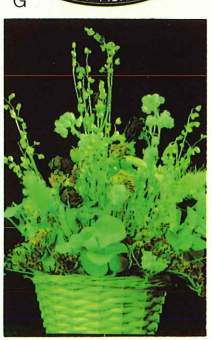
With B + G + R

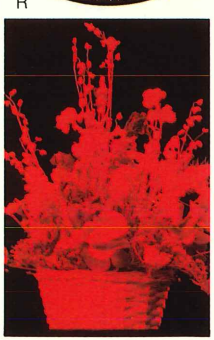
Without filter

B

G

R





Filters for Color Films

● SKYLIGHT 1B

With Skylight 1B

Reduces the excessive bluishness that frequently occurs in outdoor color photography, especially in open shade under a clear, blue sky. The absorption peak is in the range which corresponds to the film's green spectrum. This means outstanding outdoor shots with superb color balance and clarity under all conditions. Also keeps skin tones free of colored reflections from nearby objects such as the shade of trees.

Without filter

● UV (0)

With UV(0)

Absorbs the ultraviolet rays which often makes outdoor photographs hazy and indistinct.
A multi-purpose fine-weather filter for color as well as black and white films.
Also serves as a permanent lens protector.

Without filter

● 80A, 80B, 80C

These are color conversion filters for the use of daylight type color films with artificial light sources.
80A increases the color temperature from 3200°K to 5500°K for use with 3200°K lamps.
80B increases the color temperature from 3400°K to 5500°K for the use of photoflood lamps.
80C increases the color temperature from 3800°K to 5500°K for the use of clear flash bulbs.

With 80A

80A

Without filter

80B

With 80B

Without filter

80C

With 80C

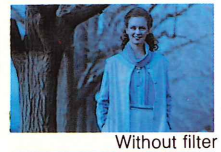
Without filter

● 85, 85B, 85C

These are color conversion filters for the use of tungsten type color films in daylight.
85 decreases the color temperature from 5500°K to 3400°K for the use of Type A color films.
85B decreases the color temperature from 5500°K to 3200°K for the use of Type B color films.
85C decreases the color temperature from 5500°K to 3800°K.
The effect obtained is the same as with daylight type color films used in daylight.

With 85

85


Without filter

85B

With 85B

Without filter

85C

With 85C

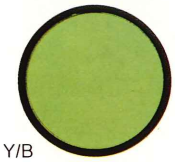
Without filter

● VARIO PL-COLOR

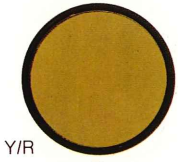
With R/B

Available in five types: Y/B, Y/G, Y/R, R/B and R/G. This filter is a combination of one gray polarizing filter and two colored polarizing filters. The color can be varied by rotating the filter frames. Many color possibilities help create new emotional effects never seen before.

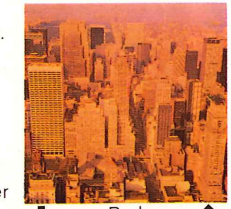
R/B

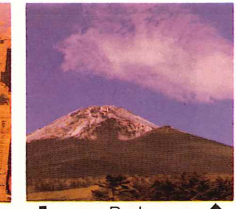

Y/B

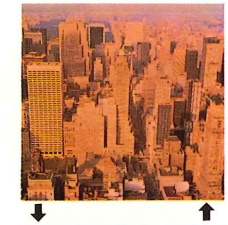
Y/G

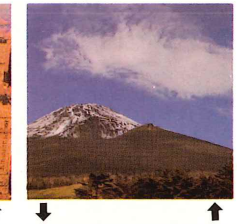

Y/R

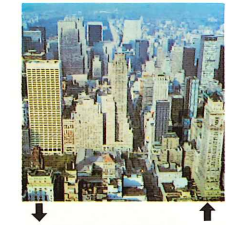
R/G

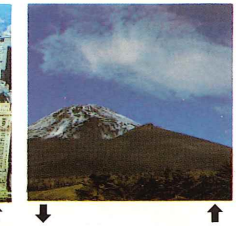

Red

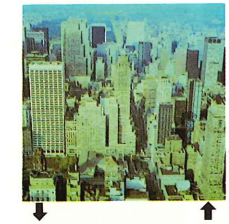

Red

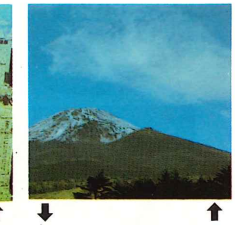




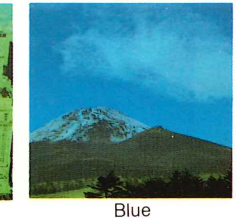








Green

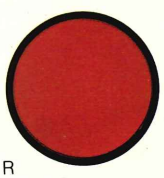

Blue

PL-COLOR

With B

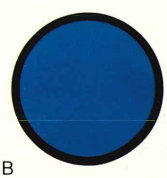
Available in four types:
B (blue), Y (yellow),
O (orange) and R (red).
A combination of gray and colored polarizing filters.
Any color from gray to the full color of the filter can be obtained by rotating the filter frame.

O



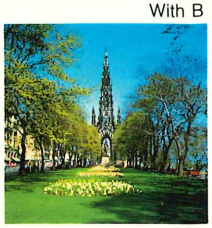
R

Y

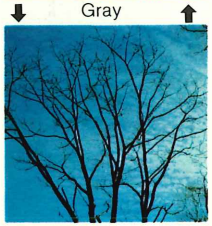


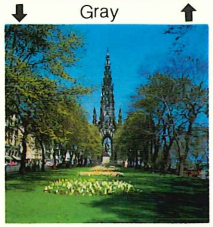
B

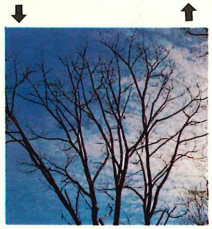
Gray

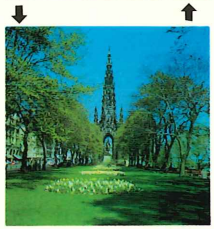


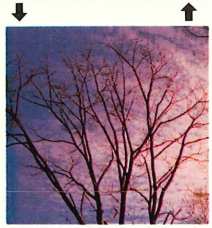
Gray

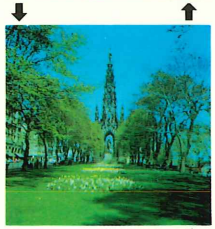


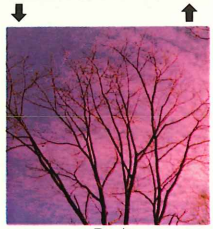




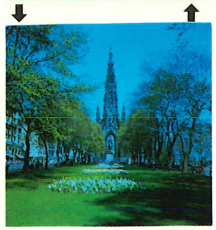








Red



Blue

82A, 82B, 82C

These are light balancing filters used to increase the color temperature slightly for a cooler (bluer) tone. Corrects the tendency toward reddish tones. As an example, select the 82B when using tungsten Type B film (3200°K) with ordinary household 100W electric bulbs (2900°K). These series filters are also used to prevent the reddish tones in early morning or late evening light for natural skin tones. These filters can be used together, but do not mix the 81 and 82 series filters since they cancel out each other.

With 82A

82A

Without filter

82B

With 82B

Without filter

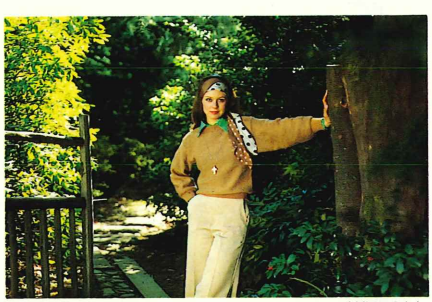
82C

With 82C

Without filter

81A, 81B, 81C

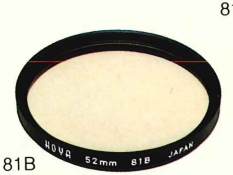
These are light balancing filters used to decrease the color temperature slightly for a warmer (redder) tone. Corrects the tendency toward bluish tones. For example, the 81A should be selected when using tungsten Type B color film (3200°K) with photoflood lamps (3400°K) These filters can be used together.



With 81A

81A

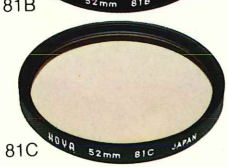
Without filter



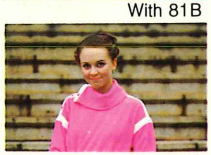
81B

With 81B

Without filter



81C



With 81C

Without filter

● FL-DAY, FL-W

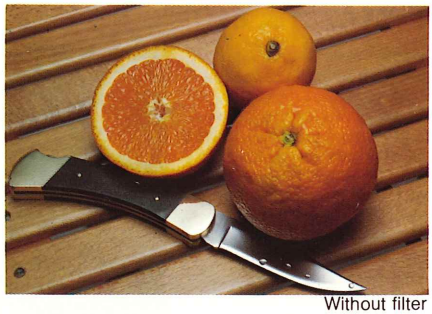
With FL-Day

Used to correct the greenish tone that appears when daylight type films are used under fluorescent lighting. FL-DAY is for use with day-light type fluorescent lamps. FL-W is for use with warm white or white type fluo-rescent lamps.
It is recommended that auxiliary light sources be used when long exposures become necessary due to insufficient light.

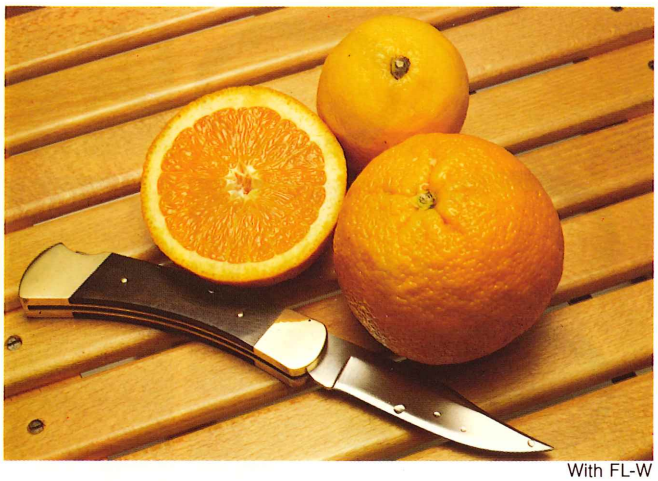
Without filter

FL-DAY

FL-W



Without filter



With FL-W

● DUAL-COLOR

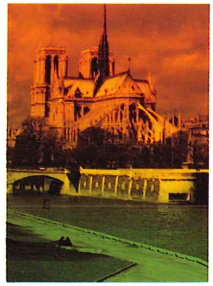
With R/B

Available in three types: O/G (orange/green), Y/P (yellow/purple) and R/B (red/blue). Made by sandwiching gelatin filters between two pieces of optical glass, DUAL-COLOR is available in a variety of two-color combinations. Contrasting foreground and background, land and sea, are only a few of the fantastic possibilities.

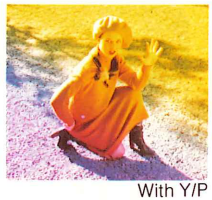
R/B

O/G

Y/P



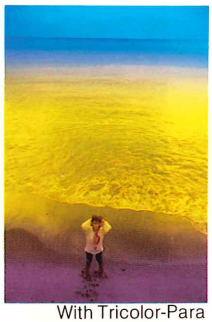
With O/G



With Y/P

● TRICOLOR

Divided into three color sections (PARA: blue, yellow and pink, TRI: blue, green and red) for imaginative three-tone effects. Available in two types: Parallel and Triangle. The effect varies depending on the focal length of the lens used and the aperture.



With Tricolor-Para

With Tricolor-Tri

PARA

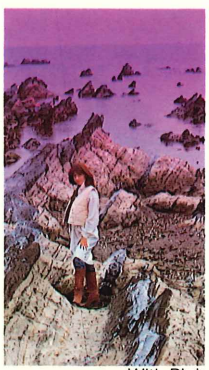
TRI

● HALF-COLOR

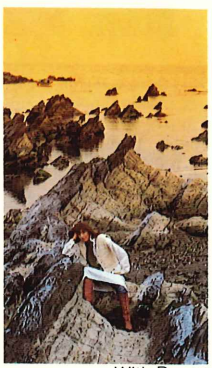
With Green

Made by sandwiching a gelatin filter between two optical glass plates. Similar to DUAL-COLOR except one-half is clear. Set in a rotating frame for added effectiveness.

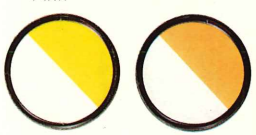
Pink



With Pink

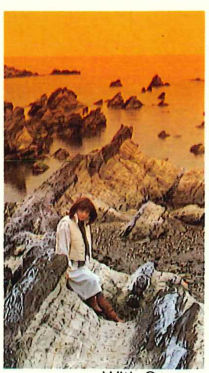


With Brown

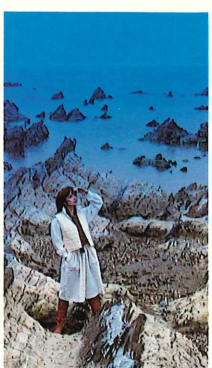


Yellow

Brown



With Orange



With Blue

Orange

Blue

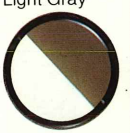
Red

Violet

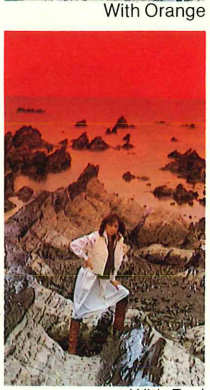
Emerald

Light Gray

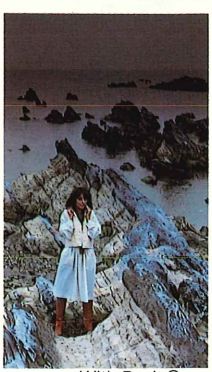
Green



Dark Gray



With Red



With Dark Gray

● PL (POLARIZING)

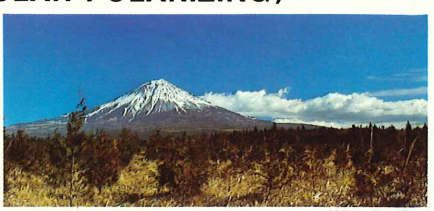
Well known for the effect of eliminating undesired reflections from non-metallic surfaces such as water, windows, etc. Also highly effective for color photography as colors can be made to appear brighter, clearer and with better contrast. For black and white photography, the effect is the same as with the Y(K2) and O(G) filters. Provides an infrared effect when used together with a R(25A) filter.

With PL

Without filter

● PL-CIR (CIRCULAR POLARIZING)

Similar to an ordinary polarizing filter, except the light rays are circular, not linear, after passing through the PL-CIR filter. Avoids possible exposure errors caused by the slight polarizing of light by cameras with TTL systems using fixed mirrors.



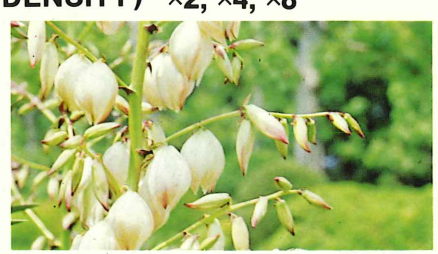
With PL-Cir

Without filter

● ND (NEUTRAL DENSITY) ×2, ×4, ×8

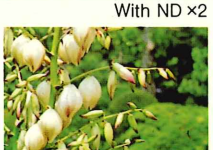
These are neutral density filters used to control the amount of light entering the camera lens for the following three reasons.

1. To adjust film speed.
2. To lower the shutter speed for special effects.
3. To decrease the depth-of-field.



With ND ×2

ND x2

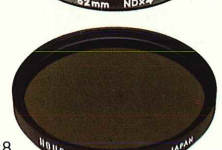


Without filter

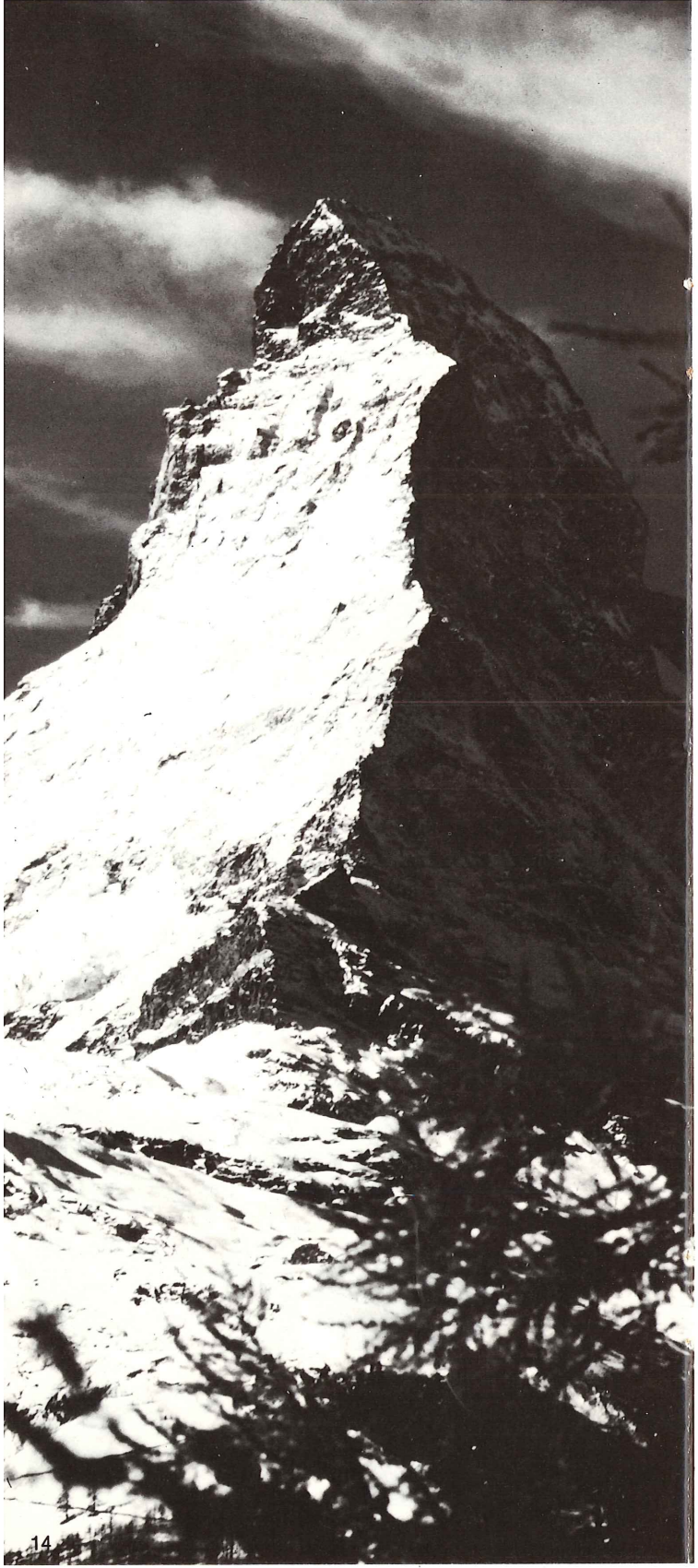
ND x4

With ND ×4

ND x8



With ND ×8



● VARI-MULTIVISION

With Vari-Multivision

Two 2-face MULTIVISIONS set in independent rotating frames. Creates multi-images that can be varied from 2- to 4-face by rotating the frames.

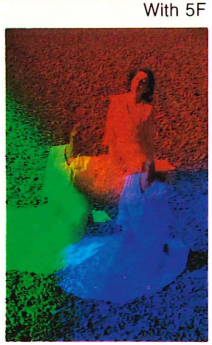
● COLOR-MULTIVISION

With 5F

Available in two types: (3F) with three faces in blue, green and red; and (5F) with five faces evenly divided into green and orange These filters produce the dynamic professional color multi-images often seen in TV or commercial photography. Results are striking with either still or movie camera.

5F

3F



With 3F

● MULTIVISION

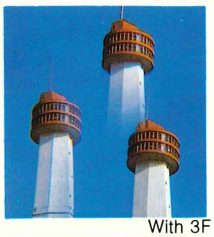
With 3PF

Available in five types: (3PF), (3F), (5F), (6F) and (6PF). Made of optical glass precisely cut into a variety of facets, MULTIVISION helps create exotic, fantastic compositions of color patterns and combinations. Effect is strongest with a relatively dark background and at larger apertures. The multi-images appear closer together with wide-angle lenses and farther apart with telephoto lenses.

With 3PF

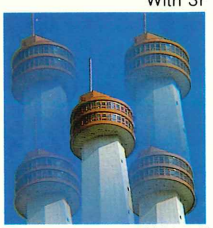
With 3PF

With 5F

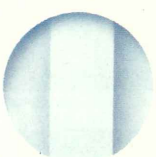


With 3F

5F

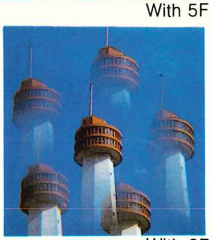


With 5F

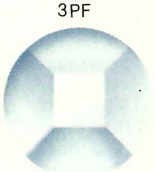


3PF

3F

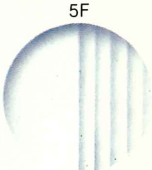


With 6F

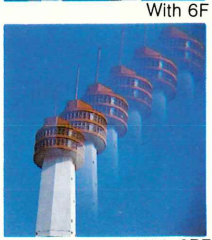


5F

6F



6PF



With 6PF

Filters for B & W Films

● UV (0)

Absorbs ultraviolet rays to eliminate fogginess. Renders landscapes and seascapes sharp and clear. Also widely used as a lens protector.

Without filter

With UV(0)

● YELLOW (K2)

Especially useful for clear contrast between blue sky with clouds and foreground. Provides a natural tone rendition. Often used for subjects at intermediate distances.

With K2

● ORANGE (G)

Increases contrast between reds and yellows. Particularly useful for distant outdoor shots taken with a telephoto lens. Also useful in color photography for spectacular sunsets, seascapes, etc.

With G

● RED (25A)

Especially effective for increasing contrast. Ideal for dramatic cloud effects in landscapes. Can also be applied creatively in color and infrared photography.

With 25A

● YELLOW GREEN (X0), GREEN (X1)

With X0

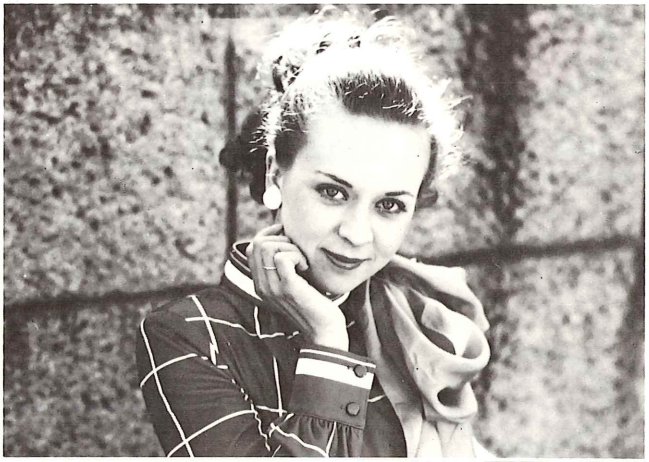
Used primarily for black and white photography. X0 is highly effective for outdoor portraits because red is rendered dark while green appears lighter. Great for correcting skin tones, bringing out facial expressions in close-ups and emphasizing the feeling of liveliness. X1 is highly effective for indoor portraits under tungsten lighting.

Without filter

YELLOW GREEN (X0)

GREEN (X1)

Without filter



With X1

● CROSS SCREEN, STAR-SIX, STAR-EIGHT

With Cross Screen

Adds a dramatic four-cross flare to very bright areas, giving a soft-focus effect. Ideal for photographs of ladies wearing jewelry or other objects with strong reflections. STAR-SIX (six-pointed light flares) and STAR-EIGHT (eight-pointed light flares) can also be used for a variety of effects.

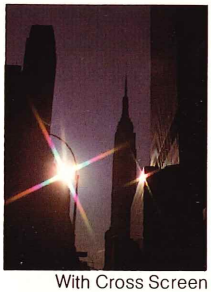
With Star-Six

With Star-Eight

CROSS SCREEN

STAR-SIX

STAR-EIGHT

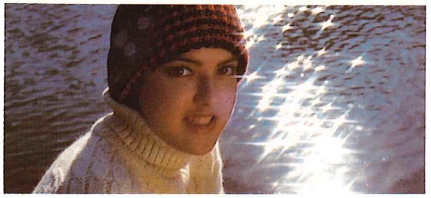


With Cross Screen

With Star-Eight

● VARIOCROSS

Two colorless glass plates with etched parallel lines on each surface and set in independent rotating frames. By rotating these frames, the effect can be varied to produce any desired expression for any highly reflective scene.



● FOG FILTER

With Fog Filter (A)

With Fog Filter (B)

Lightly veils the entire picture in white. Available in a set of two: FOG (A) and FOG (B). FOG (B) has a stronger effect than FOG (A). Both can be used together to produce an effect similar to dense fog. The effect can be varied by changing the aperture of the lens, but stopping down too far will reduce the effect.

(A)

(B)

Without filter

● DIFFUSER, DUTO

With Diffuser

Both are diffusion type filters but DIFFUSER gives a soft-focus effect due to its irregularly uneven surface while DUTO has fine concentric lines etched on its surface. The center of the picture is usually sharp with DUTO but DIFFUSER gives an overall soft-focus effect. Both are particularly effective in portraiture and commercial photography

DIFFUSER

DUTO

With Duto

Filters for Special Effects

● CENTER-SPOT

With Center-Spot

A close-up lens with a hole in the center. The periphery of the picture is rendered a delicate, soft-focus effect while the central image is sharply focused.

● SOFT-SPOT (sand screen & soft screen)

Both have a clear center spot which makes the central image stand out clearly. SAND SCREEN has a smoky appearance while SOFT SCREEN has an irregularly uneven surface. With SOFT-SPOT, the size of the clear part in the center of the picture varies depending on the lens and aperture used.

With Sand Screen

With Soft Screen

Without filter

● COLOR-SPOT

With G

A colored glass filter with a hole in its center. Available in yellow, green, red and gray. The central image stands out clearly while the background appears the color of the filter.

G

Y

R

With Y

With R

● SPLIT-FIELD

One-half of a close-up lens with the other half open. One-half of the picture receives a close-up effect while the other half is normal. Both very close and far subjects can be in focus at the same time. Or one-half of the picture can be out of focus for special effects.